

eRD3/eRD6 R&D Plan for BNL and Yale for FY19

B.Azmoun, A.Kiselev, M.Purschke, C.Woody (BNL)

R. Majka and N. Smirnov (Yale)

Investigate various forms of TPC readout in order to optimize operation at EIC

- Utilize our small TPC prototype that was redesigned and rebuilt from our TPC/Cherenkov prototype (uses same field cage & drift volume with a new, smaller and more compact enclosure that allows easy exchange of readout detector).
- Test with Multistage GEM, uMegs, Hybrid GEM+uMegs and uRWELL readout.
- Investigate various types of readout boards (including zigzags and other patterns) and different gases to optimize readout with each type of gain structure.
- Carry out simulation studies for various readout patterns and gas combinations.
- Read out using SAMPA readout electronics currently being developed for sPHENIX and/or DREAM electronics. Can also read out up to 128 ch over limited drift range using our high resolution V1742 DRS system.
- Measure spatial resolution and track resolution in a TPC operating mode using cosmic ray telescope in the lab and then in the test beam.
- Can also study laser calibration of TPC drift region using our UV laser.

Proposed Budget

Amount (\$K)	Activity
20	Readout boards (10x10 cm with uniform pad patterns)
5	Gas & misc electronic components (cables, adapter boards, etc)
10	Technical support (technician, designer)
15	Travel (includes support for Yale and partial support for test beam)
50	Total w/o overhead
25	Overhead
75	Total with overhead

Additional R&D on uRWELLS

In collaboration with UVA, FIT & Temple

Study uRWELLS with zigzag readout, including laser etched PCBs

- Send one or more of our PCBs to CERN to have uRWELL structure added onto it
- Test with our X-ray scanner and cosmic ray telescope
- Other collaborators are welcome to use these as well if they provide the manpower
- We will not request any new funds from EIC R&D for this activity